

WHAT IS CLAIMED:

1. A missile or aircraft comprising
 - a. an afterbody and a forebody;
 - b. at least one deployable flow effector on the missile or aircraft forebody;
 - c. at least one sensors each having a signal, the at least one sensor being positioned to detect flow separation on the missile or aircraft forebody; and
 - d. a closed loop control system;

wherein the closed loop control system is used for activating and deactivating the at least one deployable flow effector based on at least in part the signal of the at least one sensor.

2. The missile or aircraft in claim 1, wherein the closed loop control system activates and deactivates the at least one flow effector to minimize side forces on the missile or aircraft forebody.
3. The missile or aircraft in claim 1, wherein the closed loop control system activates and deactivates the at least one flow effector to create commanded side forces on the missile or aircraft forebody.
4. The missile or aircraft in claim 2, wherein the closed loop control system

activates the at least one flow effector by oscillation.

5. The missile or aircraft in claim 3, wherein the closed loop control system activates the at least one flow effector by oscillation.

6. The missile or aircraft in claim 4, wherein the closed loop control system only activates the at least one flow effector at angles of attack of the missile or aircraft forebody of between about 20 to about 60 degrees.

7. The missile or aircraft in claim 5, wherein the closed loop control system only activates the at least one flow effector at angles of attack of the missile or aircraft forebody of between about 20 to about 60 degrees.

8. A flow control system for a missile or aircraft forebody comprising

- a. at least one activatable flow effectors;
- b. at least one sensor having a signal, the at least one sensor being positioned to detect flow separation on the missile or aircraft forebody; and
- c. an inertial measurement unit having an output;
- d. a closed loop control system;

wherein the closed loop control system is used for activating and deactivating the at least one flow effector based on at least in part the signal of the at least one sensor and the output of the inertial measurement unit.

9. The flow control system in claim 8, comprising at least four activatable flow effectors.
10. The flow control system in claim 8, comprising at least six activatable flow effectors wherein the at least six activatable flow effectors are positioned and separated substantially equi-distantly about a center of the forebody of the missile or aircraft.
11. The flow control system in claim 8, wherein the flow effectors are capable of being activated and deactivated at frequencies of at least 1 Hz.
12. The flow control system in claim 8, wherein the flow effectors are capable of being activated and deactivated at frequencies of at least 20 Hz.
13. The flow control system in claim 8, wherein the closed loop control system activates and deactivates the at least one flow effector to create commanded side forces on the missile or aircraft forebody.
14. The flow control system in claim 12, wherein the closed loop control system activates and deactivates the at least one flow effector to create additional side forces on the missile or aircraft forebody.
15. A method of stabilization for a missile or aircraft forebody comprising the steps of
 - a. estimating or determining side forces on a missile or an aircraft forebody based at least in part on a signal from at least one sensor, the at least one sensor being positioned to detect flow separation on the missile or aircraft

forebody; the missile or aircraft forebody further comprising at least one flow effector and a closed loop control system for controlling the flow effectors;

- b. activating the at least one flow effectors to counteract the side forces by oscillation of the at least one flow effector with the closed loop controller based on at least in part the signal of the at least sensor; and
- c. re-estimating or determining side forces on the missile or aircraft forebody based at least in part on a signal from the at least one sensor; and
- d. deactivating the at least one flow effector in response to reduced or changed side forces.

16. The method of stabilization in claim 15, wherein the at least one flow effector is activated by oscillating the at least one flow effector.

17. The method of stabilization in claim 15, wherein the missile or aircraft forebody comprises at least six activatable flow effectors wherein the at least six activatable flow effectors are positioned and separated substantially equi-distantly about a center of the forebody of the missile or aircraft.

18. The method of stabilization in claim 15, wherein the forebody of the missile or aircraft is designed with asymmetries in the forebody.

19. The method of stabilization in claim 15, wherein the at least one flow effector is only activated at angles of attack of the missile or aircraft forebody of between about 20 to about 60 degrees.

20. The method of stabilization in claim 15, wherein the at least one flow effector is a deployable flow effector.